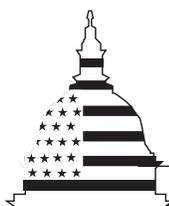


November 1999

# DEFENSE LOGISTICS

## Army Should Assess Cost and Benefits of the Workload Performance System Expansion



G A O

Accountability \* Integrity \* Reliability



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## Abbreviations

AWPS	Army Workload Performance System
DOD	Department of Defense

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United States General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-283492

November 12, 1999

The Honorable Floyd Spence  
Chairman  
The Honorable Ike Skelton  
Ranking Minority Member  
Committee on Armed Services  
House of Representatives

Accurate and consistent estimates of future workloads are essential to determine personnel requirements. The Congress included a requirement in the National Defense Authorization Act for Fiscal Year 1998 (P.L. 105-85) that the Secretary of the Army certify that the Army's new system for estimating personnel requirements—the Army Workload Performance System—was fully operational before any reduction-in-force actions could be made at any of the Army's five maintenance depots.<sup>1</sup> To this end in 1998, the House Committee on National Security<sup>2</sup> directed the Army to conduct a study and provide the Committee with its master plan for implementing the Army's Workload Performance System, including future applications and total funding for implementation.<sup>3</sup> The Committee also required that we provide it a report on the Army's study. Specifically, as agreed with your offices, we assessed (1) the Army's progress in developing and implementing the workload performance system and (2) the extent to which the Army's April 1999 report addresses an overall master plan for implementing the system, including the system's future applications and funding requirements.

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## Results in Brief

The Army has implemented and certified a basic automated workload and performance system to evaluate personnel requirements in its five maintenance depots. While the system appears to be adequate for this purpose, additional work is under way or planned to achieve improved

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<sup>1</sup> Previously approved reductions resulting from recommendations approved under the Defense Base Closure and Realignment Act were not affected by P.L. 105-85.

<sup>2</sup> Now known as the House Committee on Armed Services.

<sup>3</sup> Report 105-532 of the House Committee on National Security regarding the National Defense Authorization Act for Fiscal Year 1999.

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performance. These additional improvements include applications to identify the number of personnel excesses or shortages by type of skill, the ability to assign personnel based on skill qualifications to the most appropriate jobs, and the impact of material shortages on planned work. Additionally, development work is under way or planned to apply the workload performance system to several other functional areas, even though some questions exist about how cost-effective the system may be in some instances.

The Army's report on its congressionally required master plan provided limited and incomplete information on future development plans and did not provide requested funding information. Thus far, the Army has used working capital funds<sup>4</sup> for system development, even though the Committee's report language directed that Army working capital funds not be used for this purpose.

This report makes recommendations to develop a more comprehensive master plan and strengthen the management control and oversight of system development efforts.

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## Background

Several audit reports in recent years have highlighted the Army's inability to support its personnel requirements using analytically based workload forecasts. In the Department of Defense's (DOD) fiscal years 1997 and 1998 Annual Statements of Assurance, DOD noted difficulties in relating personnel requirements to workload and budget as a material weakness in the Army's manpower requirements determination system. In 1998 we reported on the Army's progress in taking corrective action.<sup>5</sup>

To resolve deficiencies in its civilian manpower requirements determination process, the Army initiated development of an automated system intended to capture workload data and link it to manpower requirements. In March 1996 the Army provided initial funding to its support contractor and the Navy to develop and implement a modified

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<sup>4</sup> Under this industrial funding arrangement, the Army sells goods and services to the military services based on predetermined rates designed to recoup operating costs. Working capital fund customers pay for the goods and services, primarily with operations and maintenance funds appropriated by the Congress.

<sup>5</sup> *Force Structure: Army's Efforts to Improve Efficiency of Institutional Forces Have Produced Few Results* (GAO/NSIAD-98-65, Feb. 26, 1998).

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version of a Navy-developed automated workload performance system for use at Army maintenance depots. In June 1996, a preliminary version of what is now part of the Army Workload and Performance System (AWPS) was implemented on a test basis at Corpus Christi Army Depot, one of the Army's five maintenance depots.

The AWPS depot maintenance application extracts data from several computerized Army support systems. The data are obtained electronically, and no new or unique data are collected specifically for the workload system. It provides project status and labor-hour information data collected from the depots, planned workload data from the Army Materiel Command, and workload data obtained from the Army's major customers.

A combination of Navy civilian and contractor employees is developing AWPS, with program oversight provided by Headquarters, Department of the Army, and day-to-day management oversight by the system project office under the Industrial Operations Command at Rock Island, Illinois.<sup>6</sup> A working group, comprised of representatives from a variety of Army Materiel Command activities, provides input to the project office regarding system requirements and outputs. It develops system acceptance criteria, consulting as needed with the Army Audit Agency, which acts in an advisory capacity.

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## Army Met Original Goals for AWPS, but Additional Development Continues

The Army has completed initial implementation of AWPS for depot maintenance, and it recently certified the basic system as operational at five maintenance depot locations. At the same time, the magnitude of the AWPS project has grown to a point where additional management oversight and coordination may be warranted. Numerous additional tasks have been identified and initiated to enhance the depot maintenance application, and AWPS is being expanded to four other functional areas—ammunition logistics, ammunition manufacturing, base operations support, and arsenals. Further, headquarters Army officials have identified still more functional areas for potential long-term development.

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<sup>6</sup> The Industrial Operations Command reports to the Army Materiel Command.

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### Basic AWPS Application for Depot Maintenance Implemented and Certified

On June 28, 1999, the Assistant Secretary of the Army for Manpower and Reserve Affairs certified that work on the basic workload performance system had been completed and was operational at its five maintenance depots.<sup>7</sup> The initial operating capability focused on a basic workload and planning system to facilitate management of depot workloads and the ability to identify workload/workforce imbalances at the five depots.

Overall, the depot maintenance application of AWPS takes workload and workforce information and presents it in a manner that allows shop supervisors to better manage the work flowing through their shops and permits depot managers to better manage the size and composition of their workforce. Work in developing this application included (1) gathering project data, labor expenditures, performance data, and scheduling information to support workload forecasting and personnel staffing studies; (2) capturing various personnel data, such as leave and attrition, to support analysis of alternative employment strategies; and (3) providing daily production support by comparing actual resource expenditures against production plans.

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### Further Enhancements of Depot Maintenance Application Under Development

Although the basic depot maintenance application has been certified as operational, the Army continues to develop this application to enhance its capabilities. The AWPS application for depot maintenance is evolving from a basic system that captures workload data and links it to manpower requirements to a more robust system that is expected to provide more refined information about individual skill levels. The Army's April 1999 report to the Committee identified four of these enhancements, but it excluded several tasks that were previously planned by the system project office. For example, the AWPS maintenance application is being enhanced to identify the number of needed employees by skill type and to facilitate the assignment of the most appropriate personnel to each job to maximize depot productivity over a 3-year period. Table 1 outlines the completed and certified tasks noted above as well as examples of additional tasks now under development or planned for the future to enhance the depot maintenance application.

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<sup>7</sup> Section 364 of the 1998 Defense Authorization Act prohibited the Army from initiating a reduction in force at the five Army maintenance depots until after the Secretary of the Army certified to the Committee that the workload and performance system is fully operational.

Table 1: Examples of Tasks Associated With AWPS Depot Maintenance Application as of August 1999

Task	Objectives
<b>Completed and certified</b>	
Develop and implement basic workload and planning system at five depots	Facilitate management of depot workload by identifying workload and personnel data and generating job planning information.
Develop workload and resources reporting process at five depots	Given workload and personnel resources in each depot work area, generate a report identifying net workforce imbalances.
<b>Completed</b>	
Integrate system with depot budget preparation and train industrial activity personnel in its use	Clarify the relationship between workload and workforce on the budget.
<b>Under development</b>	
Support management of contractor labor within the depots	Incorporate planning, scheduling, and performance of contractor personnel working in Army depots to provide visibility of contractor production within the depot system. Completion expected in November 1999.
Implement programming language conversion	Accomplish conversion of system from FoxPro to the Oracle language.
<b>Planned but work not begun</b>	
Develop resource, scheduling, and control skill codes	Implement coding system to refine workforce analysis by focusing on specific employee skills rather than aggregating personnel information by work area. Completion expected in March 2001.
Design and implement resource, scheduling, and control system at five depots	Size the workforce and assign the most appropriate personnel to maximize depot productivity and size the workforce using previously developed coding system. Completion expected in January 2003.
Develop and implement material system <sup>a</sup>	Support comparisons of material requirements and supply availability data to determine whether material will be available to perform planned maintenance and to facilitate make or buy decisions for parts and components. Completion expected in September 2002, but additional requirements being considered.
Implement capability to compare personnel and cost impact resulting from unforeseen changes	Support analysis of impact of potential resource or workload changes on depot production and costs.

<sup>a</sup>Project office officials stated that the use of commercial off-the-shelf software might be a more cost-effective alternative for this and other similar material tasks.

Source: Army Workload Performance System Project Office.

The tasks under development were expected to be completed between now and 2000; others not yet started are expected to be completed by 2005. However, as discussed more fully in a later section, the program has encountered a variety of schedule slippages due to funding problems and programmatic changes. Appendix I provides additional summary information regarding the individual tasks for the depot maintenance application, including projected completion dates as of August 1999.

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## Expansion of Workload Performance System to Other Applications

While the Navy system from which AWPS evolved was used only for depot maintenance, the Army's system will include applications for other functional areas. System modifications are under way or planned to support eventual system implementation in the areas of ammunition logistics,<sup>8</sup> ammunition manufacturing, and base operations support. The basic system for the ammunition, base operations support, and other follow-on applications is expected to meet the same objectives as are currently met for the depot maintenance application: scheduling workloads and identifying workforce imbalances based on an analysis of planned workload and available personnel. In commenting on a draft of this report, DOD officials stated that the Army is proceeding with limited prototype development and testing of these applications to determine the operational costs and benefits of each application and system enhancement. Officials further stated that the Army would not implement applications that do not adequately demonstrate cost-effectiveness.

Project office officials are not aware of any plans for certifying the operational effectiveness of these other system applications for the Congress.<sup>9</sup> Current plans provide that the operational effectiveness of each of the new applications and all major enhancements will be reviewed and validated by the Army Audit Agency using acceptance criteria developed by a configuration control board comprised of representatives from a variety of Army Materiel Command activities. The Industrial Operations Command will send written confirmation to the Army Materiel Command to report completion of this validation.

## Ammunition Logistics

The basic system for implementing the AWPS ammunition logistics application has been installed and has undergone system testing at selected locations. The Army Audit Agency evaluated this work and found it acceptable. Subsequently, the Industrial Operations Command informed the Army Materiel Command that the basic ammunition system had been successfully installed. Development efforts are under way or planned to enhance this application. Appendix II identifies 10 tasks and other summary information associated with this application. The follow-on tasks have projected completion dates in 2005.

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<sup>8</sup> Ammunition logistics includes such functions as storage, issuance, demilitarization, maintenance, stock rotation, and minor modifications to previously manufactured items.

<sup>9</sup> The 1998 Defense Authorization Act certification requirement applies only to AWPS implementation at the five Army maintenance depots.

Differing opinions exist regarding the usefulness of AWPS in ammunition logistics facilities. On one hand, Army officials at using organizations questioned the usefulness of automated systems and procedures for identifying temporary staff shortages and excesses given the day-to-day fluctuations in workload forecasts and the relatively short production projects generally experienced. On the other hand, Army headquarters officials stated that while workload forecasts change frequently, implementation of the planned system would enable facility managers to more effectively utilize employees. While we did not examine the ammunition logistics module sufficiently to determine the cost-effectiveness of this application, it is clear that these disparate positions need to be resolved. As discussed later, greater involvement of organizations likely to be affected by AWPS implementation may be needed in designing future applications to better ensure continued program viability and evaluate cost-effectiveness.

In commenting on a draft of this report, DOD officials stated that the Army established a configuration control board comprised of system users and developers to identify and solve various technical and programmatic issues. Further, DOD officials stated that user acceptance of the system has improved and that users have already recognized and implemented improved business practices.

### Ammunition Manufacturing

An AWPS ammunition manufacturing application is in a preliminary planning phase and the Army has not yet initiated development work. As currently planned, this application will identify workload and personnel requirements and provide plant managers with information on individual project status. Appendix III lists three tasks and summary information associated with the ammunition manufacturing application. Although work has not yet begun on these tasks, the Army currently projects completion between December 2001 and December 2005. According to Army officials at using organizations, questions exist about the cost-effectiveness of an AWPS ammunition manufacturing application given the availability of commercial off-the-shelf software and declining workload forecasts. However, Army headquarters officials stated that the use of AWPS will enable them to implement a rational personnel downsizing plan and to clearly articulate the impact of declining workloads.

### Base Operations Support

AWPS development efforts for the base operations support application are under way and have progressed to the prototyping phase. A basic system prototype is being installed at the Anniston Army Depot to be used for relating projected workload for various support functions to the personnel

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required to support these functions. Project office plans call for installing the system at the other four maintenance depots by February 2001, using a system testing procedure similar to that used during the early development of the depot maintenance application. The completion date for this effort has slipped several times, and it is unclear when this system application will be evaluated and tested. It is also unclear how beneficial this application would be, given that the Army is considering the use of public and private competitions for many of its base operations support functions. Appendix IV summarizes some of the key tasks and other information associated with the base operations support application; individual tasks are currently projected to be completed between October 1999 and December 2005.

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### Possible Expansion to Other Functional Areas

The Army has identified several activities such as field-level maintenance, arsenals, research and development, testing and evaluation, and training as possible areas for long-term expansion of the workload performance system. Development work has not been initiated in any of these areas. Further, projected completion dates have been established only for tasks associated with the arsenal application. In general, these areas involve different Army organizations and chains of command, as well as a different mix of personnel skills than are supported by the applications currently under development. It is uncertain how project management would be handled for these applications. Although the Army's recent mandated report on AWPS cited plans to develop these additional applications, AWPS project office officials told us that the project office was not consulted about inclusion of these applications in the Army's report. From their perspective, these applications have not been planned, scheduled, budgeted, or funded. Further, they stated that it is unclear how beneficial the arsenal application would be, given that the Army is considering the use of public and private sector competition for operation of some arsenal activities. See appendix V for a summary of the individual applications and selected tasks.

Although not a functional application, development is planned for a "Decision Support System," which would be deployed to Headquarters, Department of the Army, to facilitate funding and resource allocations based on Army priorities. The Decision Support System would aggregate workload and performance data from a variety of Army installations to enable headquarters commands to identify areas where performance could be improved through reengineering or setting specific performance measures and goals. While the Committee directed the Army to move

forward with development of this module as quickly as possible, development work has not yet begun in this area, and target dates for initiating and completing this action have not been established.<sup>10</sup>

**Program Expansion and Slippage of Program Milestones May Warrant Improved Program Management and Oversight**

As shown in table 2, completion dates for the remaining workload performance system tasks have slipped several times in recent months and completion milestones have yet to be established for some long-term system applications.<sup>11</sup> Army officials stated that untimely and inadequate funding are key contributing factors to these delays.

**Table 2: AWPS Schedule**

Modules	Completion date as reported Feb. 9, 1999	Completion date as reported May 4, 1999	Completion date as reported Aug. 18, 1999
<b>Short term</b>			
Depot maintenance <sup>a</sup>	Jan. 3, 2000	Sept. 30, 2002	Dec. 26, 2005
Ammunition logistics	Sept. 28, 2000	Dec. 31, 2004	Dec. 22, 2005
Ammunition manufacturing	Nov. 30, 2000	Nov. 30, 2000	Dec. 12, 2005
Base operations	June 29, 2001	June 29, 2001	Dec. 8, 2005
<b>Long term</b>			
Field-level maintenance	Not shown	Not shown	Not shown
Manufacturing arsenals	June 11, 2004	Oct. 13, 2005	Dec. 29, 2005
Base operations	Not shown	Not shown	Not shown
Training, testing, and evaluation, and research and development activities	Not shown	Not shown	Not shown
Decision support systems	Not shown	Not shown	Not shown
Other tasks in project plan, but not explicitly identified in Army report	Sept. 22, 2000	Dec. 1, 2000	Aug. 19, 2003

<sup>a</sup> Includes enhancements supporting resource scheduling and material support.

Source: Army Workload Performance System Project Office.

<sup>10</sup> Report 105-532 of the Committee on National Security.

<sup>11</sup> The reference to applications as short- or long-term reflects the descriptions used in the Army's report to the Committee.

While the current management team has implemented the basic workload and performance system at Army maintenance depots, the potential scope of the AWPS system development has expanded to other functional areas, some of which are outside the command and control of the Army Materiel Command. Further, Army officials stated that current sources of funding may be inadequate for timely completion of these future applications. Therefore, an improved management oversight structure to include representatives from organizations responsible for each of the potential functional users would appear to be necessary. For example, input from these organizations would likely be important in assessing the cost-effectiveness of developing or enhancing system applications. Additionally, in our opinion, without the involvement of responsible organizations, it is unlikely that required funding will become available.

## Army's Report on AWPS Master Plan Did Not Provide Complete Information About Programs, Costs, and Schedules

The Army's report to the Committee on a long-range master plan for the workload performance system has some important limitations. While the Committee directed the Army to report on its long-range master plan for implementing AWPS, including future applications and funding requirements, the Army's report did not include some key information that might normally be expected. For example, it provided no descriptive information other than the task titles—no objectives, no expected costs or benefits, no system development and implementation schedules, and no list of priorities.<sup>12</sup> While the Army's report provided a partial list of tasks to be completed in developing AWPS applications for depot maintenance, ammunition logistics, ammunition manufacturing, and base operations support functions at Army industrial facilities, our work shows that the report omitted several tasks that were in a project plan prepared and maintained by the system project office. Further, we found that projected completion dates have been established for some but not all of the tasks associated with these applications.

Appendix I highlights the tasks the Army report listed for the AWPS depot maintenance application. As previously noted, it also includes some depot maintenance tasks on which officials in the system project office have initiated work, but which were not listed in the Army report. According to Army officials, some of the tasks not listed in the Army's report will likely require as many resources as some tasks that were listed. Appendixes II

<sup>12</sup> While the Army's report contained no discussion of objectives, we discussed applications and tasks with project officials to obtain some information on task objectives.

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through IV summarize various tasks associated with ammunition logistics, ammunition manufacturing, and base operations support, and they also include several planned developmental tasks that were omitted from the Army's report to the Committee.

The Army report provided limited information with regard to four potential long-term system applications—manufacturing arsenals; field-level maintenance organizations; training, research and development, test and evaluation activities; and base operations support for nondepot maintenance activities. Our work shows that the Army project has established expected completion dates for the arsenal application, but completion milestones for the other long-term applications have not yet been established. In discussing a draft of this report, Army officials explained they currently have no firm plans or schedules for implementing AWPS to applications they had described as long term. Further, while the Army's report provided general descriptive information about the Decision Support System for use by Army headquarters, it did not identify associated tasks, cost estimates, development and testing schedules, or information about the relative importance or priority of the Decision Support System to the other planned system components. Appendix V provides a summary of available information for each of the potential long-term applications.

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### Army Report Provided No System Cost Information

The Army's report to the Committee provided no funding information even though congressional committee direction required it. We identified estimated costs totaling \$45 million for (1) the development and testing and (2) supporting studies of the following system applications: depot maintenance, ammunition logistics, ammunition manufacturing, base operations support at some Army industrial activities, and arsenals. This estimate does not include potential long-term costs for expanding the AWPS system to other functional areas and is based upon completion dates that are subject to continuing slippage.

Table 3 provides the estimated AWPS system program office funding for fiscal years 1996 through 2002.

Table 3: AWPS Project Office Budget Summary for Fiscal Years 1996-2002

Dollars in thousands

	1996 and 1997 costs	1998 costs	1999 budget plan	2000 budget plan	2001 budget plan	2002 budget plan	Estimated total spending
<b>Short term</b>							
Depot maintenance	\$2,746	\$3,493	\$612	\$240	\$675	\$2,110	<b>\$9,876</b>
Ammunition logistics		748	1,995	190	575	810	<b>4,318</b>
Ammunition manufacturing			200	759	700	810	<b>2,469</b>
Base operations for Army Materiel Command activities		230	1,599	1,161	750	1,145	<b>4,885</b>
<b>Long term</b>							
Field-level maintenance							
Manufacturing arsenals				1,610	700	750	<b>3,060</b>
Base operations for field-level maintenance activities							
Training, testing, research and development							
Decision Support System							
Configuration control and integrated logistics support <sup>a</sup>			2,062	3,468	4,873	1,140	<b>11,543</b>
<b>Total</b>	<b>\$2,746</b>	<b>\$4,471</b>	<b>\$6,467</b>	<b>\$7,428</b>	<b>\$8,273</b>	<b>\$6,765</b>	<b>\$36,149</b>

<sup>a</sup>Funds shown in this line are mostly for system operation and maintenance costs after a module is implemented.

Note: Some totals may appear not to add due to rounding.

Source: Army Workload Performance System Project Office.

In addition to the projected \$36.1 million estimated by the Army Workload Performance System Project Office, Army headquarters spent an additional \$3.6 million in fiscal years 1995 through 1998 for various contractor-provided studies. Additionally, costs for the system project office, which are estimated at over \$5 million for fiscal years 1996 through 2002, are not included in these estimates. Moreover, the \$36.1 million also does not include any costs for the planned Decision Support System or for potential system development and implementation for the other long-term workload performance system applications such as field-level maintenance, research and development, testing and evaluation, or training, which were listed as potential system applications in the Army report. Further, costs are expected to grow because system milestones have slipped, and they are likely to slip even further in the future.

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## Working Capital Fund Is Primary Funding Source

Despite committee direction that working capital funds not be used for the workload performance system, they have been used as the primary funding source. According to Army officials there is no approved budget for the system's development and implementation, and as a result an irregular funding stream has evolved to include working capital funds as the primary source and, to a lesser extent, the reprogramming of other available end-of-year funding. These officials believe that this funding approach has hampered efficient management and operations. In addition, officials from the Army Materiel Command stated that reliance on working capital funding increases the hourly cost of various industrially funded operations, which some believe are already unaffordable. According to these officials, the reimbursement of working capital funds for the costs of AWPS system development and implementation is being spread over 10 or more years, adding an estimated 21 cents to each direct depot maintenance work hour and about 34 cents to each direct ordnance work hour.

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## Conclusions

The Army's report to the Committee on a master plan for the workload performance system has some important limitations in providing complete information on the scope of work, completion milestones, and cost information. Our assessment of the Army's report also indicates that improved program planning and management are essential if the Army is to cost-effectively complete the system implementation in a timely manner—including planned program expansion. Further, some questions exist concerning the cost benefit of developing and implementing additional applications outside the depot maintenance function. Adoption of an improved master plan and management structure could also be important to the Army's ability to achieve the objectives of the Army Workload Performance System. Such steps could be important in validating system applications, documenting the cost and benefits of proposed new system applications and enhancements, establishing system priorities, improving system management, and obtaining required funding.

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## Recommendations

To improve program management and provide a baseline for future program evaluation, we recommend that the Secretary of Defense require the Secretary of the Army to assess the cost-effectiveness of using the Army Workload Performance System for nondepot maintenance applications before proceeding with development and implementation. Based on the completed assessment, we further recommend that the Secretary of the Army:

- Develop a more substantive master plan that incorporates all applications for which the system is to be implemented. This master plan should include priorities, cost and benefits, and proposed schedules.
- Assess the adequacy of existing program management and oversight structures in light of (1) additional functional applications and overall funding requirements and (2) the potential for extending the workload and performance system to users outside the Army Materiel Command.

## Agency Comments and Our Evaluation

DOD provided written comments that are included as appendix VI. DOD officials also provided a number of suggested technical changes that have been incorporated into the report body as appropriate. DOD officials agreed that the cost and benefits of each expanded system application should be analyzed, but did not agree with our draft report's recommendation to delay approval of additional funding for system development until after the cost benefits of each application are fully documented and analyzed. DOD concurred with our recommendations to develop a more substantive Army Workload Performance System master plan (including cost, benefits, and schedules for developing each application) and to assess the adequacy of program management and oversight in view of the expanded range of system applications and increased funding requirements.

In commenting on our recommendation to postpone additional funding, DOD officials stated that the Army is currently developing prototype systems for several functional applications, including ammunition storage, ammunition manufacturing, and base operations. According to these officials, ongoing prototype development and tests are designed to demonstrate the usefulness of each application and provide a baseline for assessing costs and benefits. DOD officials stated that postponing additional funding for completing this work would unnecessarily hinder progress and delay efforts to correct previously reported weaknesses in the Army's ability to link personnel requirements to workload estimates.

We agree that DOD has made substantial progress in its efforts to correct material weaknesses in its ability to match personnel authorizations to forecasted workloads at its major maintenance depots. While the Army has already initiated efforts to achieve similar goals at other activities, we continue to believe that approval of funding for full-scale development and implementation of expanded applications should be postponed until costs and benefits are analyzed. However, we modified our draft report

recommendation to enable completion of ongoing prototype testing in order to demonstrate and document the financial benefits of each expanded application before proceeding with system development and implementation of the applications. DOD officials stated that they concurred with our modified recommendation.

With regard to our recommendation to develop a more substantive master plan for implementation of performance system applications at nondepot maintenance facilities, DOD stated that such a plan would be completed by July 2000. They stated that the plan would include information on priorities, cost and benefits, and milestones for all anticipated Army Workload Performance System applications, including maintenance, ammunition, and base operations.

With regard to our recommendation to assess the adequacy of existing program management and oversight structures, DOD concurred, but gave no time frame for completing the assessment. We continue to believe that such an assessment should be done as soon as possible, in light of (1) the potential for expanding the workload and performance system to activities outside the Army Materiel Command and (2) system development costs, which exceed the criteria for managing the Army Workload Performance System program as a major automated information system acquisition.

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## Scope and Methodology

To assess the status of the Army Workload Performance System, we read the Army's April 1999 report to the Committee and discussed its contents with senior officials in the offices of the Assistant Secretary of the Army (Manpower and Reserve Affairs) and Army Deputy Chief of Staff for Logistics, Washington, D.C.; the Army Workload Performance System Project Office at Rock Island, Illinois; and the Naval Sea Logistics Center, Pacific, Concord, California. We also discussed supplemental project planning and budgeting information with these same officials. We compared those portions of the Army report dealing with system depot maintenance with comparable portions of Army budget and schedule documents. We also reviewed the major blocks of work to be done and discussed their cost and benefits. During our visit to the Navy facility, we attended a workload performance system training course with managers from depots and with a professional staff member from the organization that developed the system of evaluating depot overhead personnel requirements. We met with Army Audit Agency officials regarding their review of the workload performance system. Finally, we interviewed senior

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officials from some of the five maintenance depots that implemented the system.

To assess the status of the other workload performance system applications, including their cost, we visited and interviewed a wide variety of personnel. We discussed task status, possible cost and benefits, and other relevant issues with the system program manager, the Navy program manager, support contractor personnel, and senior Army officials in Army Materiel Command and Headquarters, Department of the Army. We discussed the issues with senior managers of the two manufacturing arsenals. We also visited the senior manager of one of the ammunition depots and spoke with senior officials at five others, sending written questions to all six. We also talked with officials from the Army's Industrial Operations Command's Army Workload Performance System Project Office at Rock Island, Illinois; the Naval Sea Logistics Center, at Concord, California; and the Army's support contractor at Washington, D.C. During our Rock Island visit and numerous follow-on conversations, we discussed the project plan, including program schedules and budgets. We also reviewed the major blocks of work to be done, discussed their cost and benefits and discussed our concerns and some of the organizations slated to receive parts of the system. We also talked at length with the Navy workload performance system program manager about plans to export the system, and its use for other applications. During our meetings with the support contractor, our primary focus was on tasks and modules other than depot maintenance.

We conducted our review from February 1999 through September 1999 in accordance with generally accepted government auditing standards.

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We are sending copies of this report to Senator John W. Warner, Chairman, and Senator Carl Levin, Ranking Minority Member, Senate Committee on Armed Services; the Honorable William S. Cohen, the Secretary of Defense; the Honorable Louis Caldera, Secretary of the Army; the Honorable William J. Lynn, Under Secretary of Defense (Comptroller); and the Honorable Jacob Lew, Director, Office of Management and Budget. Copies will also be available to others upon request.

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If you or your staff have any questions concerning this report, please call me or Barry Holman at (202) 512-8412. Key contributors to this report were Julia Denman, David Epstein, and Glenn Knoepfle.

A handwritten signature in black ink that reads "David R. Warren". The signature is written in a cursive style with a long horizontal flourish at the end.

David R. Warren, Director  
Defense Management Issues

# Army Workload Performance System Application for Depot Maintenance

Task name	Estimated completion date	Objectives and expected results
<b>Completed and certified</b>		
Develop and implement basic workload and planning system at five depots	March 1998	Facilitate management of depot workload by identifying workload and personnel data and generating job planning information
Develop workload and resources reporting process at five depots	March 1998	Given workload and personnel resources in each depot work area, generates a report identifying net workforce imbalances and displaying monthly depot workforce excesses or shortages over a 3-year horizon
<b>Completed</b>		
Integrate workload performance system with depot budget preparation and train industrial activity personnel in its use <sup>a</sup>	February 26, 1999	Link workload, workforce, and budget
<b>Under development</b>		
Develop contractor labor application for depot maintenance	November 30, 1999	Incorporate planning, scheduling, and performance of contractor personnel working in Army depots to provide visibility of contractor production within the depot system  Completion of this task should improve 50-50 report preparation and provide a link between contractor labor capabilities, job scheduling, and capacity utilization
Implement programming language conversion <sup>a</sup>	July 31, 2000	Convert programs to state-of-the-art computer language; the Army plans to convert the programming language from FoxPro to Oracle  Conversion of computer programs should simplify software maintenance, improve data distribution and processing time, and facilitate use of web pages
<b>Planned but work not begun</b>		
Develop resource scheduling and control skill codes methodology	March 30, 2001	Design coding system to refine workforce analysis by focusing on specific employee skills rather than aggregating personnel information by work area  Completion of this and the next task should facilitate assigning appropriate personnel to each job to maximize depot productivity and identify skills that should be acquired, whether through retraining or hiring
Implement resource, scheduling, and control system at five depots	January 24, 2003	Implement system to assign the most appropriate personnel to maximize depot productivity and size the workforce through the use of previously developed coding system to support comparisons over a 3-year period
Develop and implement material system	September 16, 2002	Determine whether material will be available to perform planned maintenance  Facilitate make or buy decisions by collecting labor and material costs
Implement automated comparison of headquarters-directed changes <sup>a</sup>	August 30, 1999	Provide support in analyzing the impact of headquarters-directed changes concerning personnel hiring practices, workload changes, and other unforeseen changes

<sup>a</sup>Included in project office plan, but not in Army's report to the Committee.

Source: Army Workload Performance System (AWPS) Project Office.

# AWPS Application for Ammunition Logistics

Task name	Estimated completion date	Objectives and expected results
<b>Completed</b>		
Prototype ammunition logistics application at Letterkenny Army Depot	May 31, 1999	Facilitate scheduling of ammunition logistics workload by identifying monthly ammunition logistics facility workforce excesses or shortages over a 3-year period
Install basic ammunition logistics application at Anniston and Red River Army Depots (basic system develops same information as generated in first two tasks of depot maintenance application)	June 29, 1999	Facilitate scheduling of ammunition logistics workload by displaying monthly ammunition logistics workforce excesses or shortages over a 3-year period  Organizational relocation of some ammunition facilities will likely lead to additional programming requirements and possible slippage of this and other tasks
<b>Under development</b>		
Install basic ammunition logistics application at Blue Grass Army Depot, Tooele Army Depot, Sierra Army Depot, Crane Army Ammunition Activity, McAlester Army Ammunition Plant, and Pine Bluff Arsenal	June 30, 2000	Facilitate scheduling of ammunition logistics workload by displaying monthly ammunition logistics workforce excesses or shortages over a 3-year period
Provide training and technical support <sup>a</sup>	March 30, 2000	Train personnel in workload performance system use, particularly supervisors and managers and provide support to answer questions
Implement programming language conversion <sup>a</sup>	September 28, 2001	Convert programs to state-of-the-art computer language (the Army plans to convert the programming language from FoxPro to Oracle)
<b>Planned but work not begun</b>		
Develop contractor labor application for ammunition	June 30, 2000	Incorporate planning, scheduling, and performance of contractor personnel working in ammunition logistics facilities to provide visibility of contractor production within the ammunition logistics system
Design and implement resource scheduling and control system for ammunition logistics	December 30, 2003	Implement system to assign the most appropriate personnel to maximize ammunition logistics facility productivity and size the workforce through the use of previously developed coding system to support comparisons over a 3-year period
Develop "What happens if . . ." study capability <sup>a</sup>	May 31, 2000	Facilitate decision-making by management in addressing questions such as "what if"
Develop automated comparison of headquarters directed changes <sup>a</sup>	August 31, 2001	Assists analysis of impact of headquarters-directed changes
Develop ammunition logistics material system <sup>a</sup>	March 29, 2002	Determine whether material will be available to perform planned maintenance  Facilitate make or buy decisions by collecting labor and material costs

<sup>a</sup>Included in project office plan, but not in Army's report to the Committee.

Source: Army Workload Performance System Project Office.

# AWPS Application for Ammunition Manufacturing

Task name	Estimated completion date	Objectives and expected results
<b>Planned but work not begun</b>		
Design and install workload performance system for ammunition manufacturing	December 31, 2001	Facilitate management of ammunition manufacturing plants by identifying workload and personnel data and generating job planning information
Implement resource scheduling and control system design and implementation for ammunition manufacturing	December 31, 2003	Implement system to assign the most appropriate personnel to maximize depot productivity and size the workforce through the use of a previously developed coding system to support comparisons over a 3-year period
Install enhancements for ammunition manufacturing <sup>a</sup>	December 31, 2003	Provide "what if" study capability  Provide automated comparison of headquarters directed changes  Complete basic system with workload and resources reporting process

<sup>a</sup>Included in project office plan, but not in Army's report to the Committee.

Source: Army Workload Performance System Project Office.

# AWPS Application for Base Operations

Task name	Estimated completion date	Objectives and expected results
<b>Completed</b>		
Complete preliminary planning and design of application <sup>a</sup>	January 14, 1999	Facilitate management of base operations activities by identifying workload and personnel requirements data
<b>Under development</b>		
Complete prototype testing at Anniston Army Depot	October 31, 1999	Test prototype system for base operation support at a selected maintenance depot
Provide training and technical support <sup>a</sup>	December 4, 2002	Train personnel in workload performance system use, particularly supervisors and managers, and provide support to answer questions
Implement programming language conversion <sup>a</sup>	June 29, 2001	Convert programs to state-of-the-art computer language (the Army plans to convert the programming language from FoxPro to Oracle)
<b>Planned but work not begun</b>		
Install application at four other maintenance depots	February 20, 2001	Expand testing of basic workload performance system base operations support system, similar to first task of depot maintenance application
Install base operations support application at remaining workload performance system installations	December 30, 2002	Expand use of basic workload performance system base operations support system, similar to first task of depot maintenance application
Design and implement resource scheduling and control system design for base operations support system	February 3, 2004	Implement system to assign the most appropriate personnel to maximize base operations support productivity and size the workforce through the use of previously developed coding system to support comparisons over a 3-year period
Material application for base operations support system	January 15, 2003	Determine whether material will be available to perform planned maintenance Facilitate make or buy decisions by collecting labor and material costs
Contractor labor in model <sup>b</sup>	May 21, 2001	Incorporate planning, scheduling, and performance of contractor personnel working in industrial facilities to provide visibility of contractor production within the base support function
"What-if" study capability <sup>a</sup>	September 2, 2002	Facilitate decision-making by management in addressing questions such as "what if"
Implement workload and resources reporting process and resource scheduling and control code system <sup>a</sup>	June 7, 2002	Implement system to assign the most appropriate personnel to maximize productivity and size the workforce through the use of previously developed coding system to support comparisons over a 3-year period  Given workload and personnel resources in each base operations support work area, generate a report identifying net workforce imbalances and displaying monthly workforce excesses or shortages over a 3-year horizon  Implement workload and resource scheduling reporting system
Implement automated comparison of headquarters directed changes <sup>a</sup>	October 16, 2002	Provide support in analyzing the impact of headquarters-directed changes concerning personnel hiring practices, workload changes, and other unforeseen changes

<sup>a</sup>Included in project office plan, but not in Army's report to the Committee.

Source: Army Workload Performance System Project Office.

# Future AWPS Applications

Task name	Estimated completion date	Objectives and expected results
<b>Manufacturing arsenal application (planned but work not begun)</b>		
Design and implement AWPS prototype at one manufacturing arsenal	June 6, 2002	Develop and test prototype of workload performance system for arsenals
Install workload performance system at two remaining arsenals	June 13, 2003	Develop and test prototype at remaining arsenals
Design and implement miscellaneous enhancements to arsenal application to include "what if" capability, contractor labor, and automated comparison of headquarters-directed changes <sup>a</sup>	October 3, 2003	Implement "what if" capability, contractor labor, and snapshot enhancements (all previously described)
Design and implement material system for arsenals <sup>a</sup>	May 11, 2004	Determine whether material will be available to perform planned maintenance Facilitate make or buy decisions by collecting labor and material costs
Design and implement resource scheduling and control system <sup>a</sup>	February 19, 2004	Implement system to assign the most appropriate personnel to maximize arsenal productivity and size the workforce through the use of previously developed coding system to support comparisons over a 3-year period
<b>Field-level maintenance organization application (not planned, no work done)</b>		
Design and install AWPS at field-level maintenance facilities performing depot-type maintenance workloads	Not planned or scheduled by system project office	Not yet determined
Design and install workload and performance system at all general support maintenance facilities	Not planned or scheduled by system project office	Not yet determined
Other incomplete tasks not in Army study, but in AWPS project plan	Not planned or scheduled by system project office	Not yet determined
<b>Base operations applications for non depot maintenance facilities (not planned, no work done)</b>		
Design and install AWPS to support base operations at non depot maintenance facilities	Not planned or scheduled by system project office	Not yet determined
Design and install AWPS to support base operations at all general support maintenance facilities	Not planned or scheduled by system project office	Not yet determined

(continued)

**Appendix V  
Future AWPS Applications**

Task name	Estimated completion date	Objectives and expected results
<b>Training, testing and evaluation, and research and development activity applications (Not planned, no work done)</b>		
Study prototype system demonstrations for classroom training activities, testing, organizations, war reserve management and maintenance organizations, and research and development laboratories	Not planned or scheduled by system project office	Not yet determined
Other incomplete tasks not in Army study, but in AWPS Project Plan	Not planned or scheduled by system project office	Not yet determined

<sup>a</sup>Included in project office plan, but not in Army's report to the Committee.  
Source: Army Workload Performance System Project Office.

# Comments From the Department of Defense



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON DC 20301-3000

OCT 26 1000

Mr. David Warren  
Director, Defense Management Issues  
National Security and International Affairs Division  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. Warren:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "DEFENSE LOGISTICS: Army Should Delay Workload Performance System Expansion Until Cost Benefits Are Shown," September 16, 1999 (GAO Code 709410/OSD Case 1897). The Department agrees that the Army Workload Performance System (AWPS) master plan should be updated to reflect the latest development plans. However, the Department does not agree that further expansions of AWPS should be halted until an economic analysis is conducted for each new potential application. Delaying funding would adversely affect the program's implementation schedule as well as drive up the costs by forcing efforts already underway to be stopped.

The Army is currently developing an updated comprehensive AWPS master plan that will address all currently planned applications, including maintenance, ammunition and base operations. The Army is prototyping AWPS in various settings, including ammunition storage, ammunition manufacturing and base operations, not only to determine its utility but also its cost effectiveness. Postponing approval of funding for such developments until after the cost-effectiveness of each application and enhancement is fully analyzed and documented is impractical and would unnecessarily hinder progress.

In the past, the GAO has admonished the Army for its inability to link personnel to workload. The Army should be commended for resolving this problem in its maintenance depots by applying an existing Navy-developed system. Rather than discouraging the Army from building upon this success, the Department believes that the Army should be encouraged to test whether AWPS will work well in tying workload to personnel in other settings, such as for ammunition and base operations. If the tests do not validate that the benefits outweigh the costs for other applications, the Army has indicated it will not deploy them.

The GAO has informally indicated that in the final report they intend to modify the draft report recommendation to eliminate a requirement for a cost benefit analysis as a prerequisite to further developments. The Department concurs that such a change would improve the recommendation and the report and remove our primary objection to both.



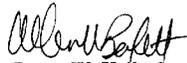
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**Appendix VI**  
**Comments From the Department of Defense**

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The detailed DoD comments on the draft GAO report recommendations are provided in the enclosure. Additionally, we informally provided your staff suggested changes to the draft report to improve its accuracy and clarity. The DoD appreciates the opportunity to comment on the draft report.

Sincerely,

  
for Roger W. Kallock  
Deputy Under Secretary  
of Defense (Logistics)

Enclosure:  
As stated

GAO DRAFT REPORT DATED SEPTEMBER 16, 1999  
(GAO CODE 70914) OSD CASE 1897

“DEFENSE LOGISTICS: ARMY SHOULD DELAY WORKLOAD  
PERFORMANCE SYSTEM EXPANSION UNTIL COST BENEFITS ARE  
SHOWN”

DEPARTMENT OF DEFENSE COMMENTS TO  
THE GAO RECOMMENDATIONS

**RECOMMENDATION 1:** The GAO recommended that the Secretary of Defense require the Secretary of the Army to postpone approval of additional financial resources for development of the Army Workload Performance System for non-depot maintenance applications until the cost-effectiveness of each application and enhancement is fully analyzed and documented. (p. 14/GAO Draft Report)

**DOD RESPONSE:** Non-concur as currently written for reasons discussed below. However, the GAO has informally indicated that they intend to change the draft report recommendation in the final report to eliminate a requirement for a cost benefit analysis as a prerequisite to further developments. If so, the Department would likely concur with the modified recommendation since it would remove our primary objection to the recommendation.

As the GAO indicated in this report, the Army has already certified Army Workload Performance System (AWPS) for depot maintenance applications. The Army Audit Agency concluded in Report AA 98-258, dated July 31, 1998, that the system successfully met an approved set of goals and metrics criteria established for measuring the operational status of the system at the maintenance depots. Further, it found that the goals of desired outputs and functions that fulfilled managers' needs for information were met. The metrics of numeric measurements by which to assess the system's output were demonstrated as sufficiently reliable to achieve the operational goals. The system's programming logic was proven sound.

System modifications are under way or planned to support eventual system implementation in the areas of ammunition logistics, ammunition manufacturing, and base operations support. The basic system for the ammunition, base operations support, or other follow-on applications are expected to support the same objectives as are currently accomplished for the depot maintenance application: scheduling workloads and identifying workforce imbalances based on an analysis of planned workload and available personnel. Current plans provide that the operational effectiveness of each of the new applications and all major enhancements will be reviewed and validated by the Army Audit Agency using acceptance criteria developed by a joint user-Army Audit Agency committee. The Industrial Operations Command will send written confirmation to the Army Materiel Command to report completion of this validation.

Now on p. 15.

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**Appendix VI**  
**Comments From the Department of Defense**

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AWPS is a capstone system designed to integrate existing workload, workforce and financial data into a single graphic program to measure current performance and future needs. While it was originally designed for use at maintenance depots, that full implementation demonstrated the potential value of AWPS for other applications, including maintenance, ammunition and base operations. Planning for full testing and proof of principle through cost-benefit analysis has proceeded accordingly.

The Army would experience several problems associated with delays in funding ongoing development efforts. For example, such delays would result in termination of subject matter expert personnel necessary to complete AWPS. The result is that the Army would spend more money in implementation in the longer term. As GAO indicated, the Army has already certified the basic AWPS and this expansion is obviously a logical extension of that proven capability. It is necessary in order to gather the required data and develop the prototype test systems necessary to assess the cost-effectiveness of each application and enhancement to AWPS. Based on the results of testing and completed cost analysis, additional financial resources would be scheduled for further development and implementation of AWPS.

**RECOMMENDATION 2:** The GAO recommended that the Secretary of Army develop a more substantive master plan that incorporates all applications for which the system is to be implemented. This master plan should include priorities, costs and benefits, and proposed schedules. (p. 14/GAO Draft Report)

**DOD RESPONSE:** Concur. The Army is developing a more master plan that will address all anticipated applications of the AWPS, including maintenance, ammunition and base operations, and will include priorities, costs, benefits, and milestones. The plan will be completed by July 2000.

**RECOMMENDATION 3:** The GAO recommended that the Secretary of Army assess the adequacy of existing program management and oversight structures responsible for system development and implementation in light of the increased range of functional applications and overall funding requirements, as well as the potential for extending the workload and performance system to users outside the Army Materiel Command. (p. 14/GAO Draft Report)

**DOD RESPONSE:** Concur. The Secretary of Army will assess the adequacy of existing program management and oversight structures responsible for system development and implementation.

Now on p. 16.

Now on p. 16.

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